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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,611	07/10/2003	Morris D. Stillabower	DP-308655	3336

22851 7590 12/15/2005  
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EXAMINER

SEMENENKO, YURIY

ART UNIT PAPER NUMBER

2841

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/616,611

Applicant(s)

STILLABOWER, MORRIS D.

Examiner

Yuriy Semenenko

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 07 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6-17 and 28-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-17 and 28-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. Amendment filed on 10/07/2005 has been entered.  
In response to the Office Action dated 7/07/ 2005, Applicants has amended claims 1-4, 6-11, 13-15,17, 28-36 and 38. Claims 5 and 18-27 had been canceled.  
Claims 1-4, 6-17, 28-38 are now pending in the application.

### ***Response to Arguments***

- 2.1. Applicant's arguments filed 9/29/2005 have been considered and acknowledged.  
but are moot in view of the new grounds of rejection.
- 2.2. Applicant arguments with respect to claim 1 is not persuasive. References of Wannamaker and APA still read on claim 1 nevertheless differences which applicant pointed out.

### ***Specification***

3. The Specification amendments, filed on 10/07/2005 are considered and is acknowledged.  
Objection due to informalities have been withdrawn.

### ***Claim Objections***

4. Claim 2 is objected to because of the following informalities:  
Claim 2 "second apertures" should be changed to – the second apertures—for proper antecedence basis.  
Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5.1. Claims 1-3, 6-9, 11, 15, 31-34, 36 are rejected under 35U.S.C. 103(a) as being obvious over R. Wannamaker (SIR, Reg. Number: H921 hereinafter "Wannamaker") in view of Applicant's own admission of prior art hereinafter APA.

5.1.1. Regarding claim 1: Wannemacher discloses in Fig. 1. a circuit assembly comprising a substrate 11 and a surface-mount device 17 mounted thereto, multiple electrically-conductive pads 14 and 15 present on at least one device attachment region 21 and 22 of the substrate, and solder joints bonding the surface-mount device to the pads ( column 3, lines 41-44); the substrate comprising: first 36, Fig. 3 and second 39

apertures delineate first and second cantilevered members 30 and 31, respectively within the at the least one device attachment region of the substrate, first and second cantilevered members being more compliant than the second region of the substrate, the first 30 and second 31 cantilevered members have peripheral borders delineated by the first and second apertures, respectively, and each of the first and second cantilevered members having a boundary between and not delineated by the first and second apertures, and at least a first of the pads being located on the first cantilevered member and a third aperture 37, Fig. 3, within the at least one device attachment region and over which the surface-mount device is mounted, the third aperture being between and discrete from the first and second apertures.

However, Wannemacher doesn't explicitly teach the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

APA discloses in the "Background of the invention" section (page 2, [0005]), at the time the invention was made, it was known to use the at least one device attachment region and a second region of the substrate being formed of a first material [organic substrates] and the surface-mount device comprising a package formed of a second material [the silicon or ceramic materials of SMT devices] having a lower coefficient of thermal expansion than the first material. But it is not conventional practice because of significant mismatch in coefficients of thermal expansion and as result big stress, developing in such structures. Wannemacher's invention overcame this problem by creating stress controlling mounting structures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

Benefit of doing so is to lower cost of such assembly.

5.1.2. Regarding claim 2: Wannemacher discloses in Fig. 3. a circuit assembly having all of the claimed features as discussed above with respect claim 1, wherein the first 36 and second 39 apertures are not symmetrical about an axis through the third aperture 37.

Notes: Applicant teaches (Remarks, page 15) amended claim 2 is supported in Fig. 4 and 5, but the first and second apertures are symmetrical about an axis through the third aperture in Fig. 4 and 5.

5.1.3. Regarding claim 3: Wannemacher discloses in Fig. 3. a circuit assembly according to claim 1, wherein each of the first 36 and second 39 apertures is U-shaped in the plane of the substrate.

5.1.4. Regarding claim 6: Wannemacher discloses in Fig. 3. a circuit assembly according to claim 5, wherein the boundaries of the first 36 and second 39 cantilevered members face each other so that a central region of the at least one device attachment region is between the first and second cantilevered members.[consider all area between aperture 36 and aperture 39 as a central region of the one device attachment region].

5.1.5. Regarding claim 31: Wannemacher discloses in Fig. 3. a circuit assembly comprising: a substrate 11 formed of a first material and comprising a device attachment region and a second region outside the device attachment region; first 36 and second 39 slots formed in the substrate 11 so as to be separated by the device attachment region, the first and second slots being substantially U-shaped in the plane of the substrate and delineating first 30 and second 31 cantilevered members, respectively, within the device attachment region, the first and second compliant members having oppositely-disposed peripheral borders delineated by the first and second slots, respectively, the first and second cantilevered members having boundaries that are not delineated by the first and second slots and are spaced apart by a central region of the device attachment region between the first and second cantilevered members, the first and second compliant members being more compliant

than the second region of the substrate; a central aperture 37 and 38 , Fig. 3 within the device attachment region and between and discrete from the first and second slots; multiple electrically-conductive pads 34, 35 present on the first and second cantilevered members; a surface-mount device 17 mounted to the first and second cantilevered members and over the central aperture; and solder joints 18 and 19 bonding the surface-mount device to the pads 34 and 35.

However, Wannemacher doesn't explicitly teach the surface-mount device comprising a chip formed of a second material having a lower coefficient of thermal expansion than the first material of the substrate.

Applicant discloses in the "Background of the invention" section (page 2, [0005]), at the time the invention was made, it was well known to use the surface-mount device comprising a chip formed of a second material [the silicon or ceramic materials of SMT devices] having a lower coefficient of thermal expansion than the first material of the substrate[organic substrates]. But it is not conventional practice because of significant mismatch in coefficients of thermal expansion and as result big stress, developing in such structures. Wannemacher's invention overcame this problem by creating stress controlling mounting structures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the surface-mount device comprising a chip formed of a second material having a lower coefficient of thermal expansion than the first material of the substrate.

Benefit of doing so is to more durable surface-mount devices.

5.1.6. Regarding claim 7: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 6, wherein the a third aperture 37 is located in the central region of the at least one device attachment region.

5.1.7. Regarding claim 32: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 31, wherein first (vertical slot) and second (horizontal slot) slots are not symmetrical about an axis through the central aperture 56.

5.1.8. Regarding claims 8, 33: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 7 (31), wherein the central aperture 56 extends into each of the first 57 and second 58 cantilevered members separated by the central region.

5.1.9. Regarding claims 9, 34: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 1 (31), wherein the central aperture 56 has a substantially rectilinear shape in the plane of the substrate.

5.1.10. Regarding claims 11, 36: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 1 (31), further comprising conductive runners 32 and 33 that electrically interconnect the pads 34 and 35 on the first 30 and second 31 cantilevered members to the second region of the substrate.

5.2. Claims 15-17 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of Applicant's own admission of prior art hereinafter APA and Corisis et al. (Patent #6306687, hereinafter "Corisis").

5.2.1. Regarding claim 15: Wannemacher discloses in Fig. 1. a circuit assembly comprising a substrate 11 and a surface-mount device 17 mounted thereto, multiple electrically-conductive pads 14 and 15 present on at least one device attachment region 21 and 22 of the substrate, and solder joints bonding the surface-mount device to the pads ( column 3, lines 41-44); first 36, Fig. 3, second 39 apertures and third sets 37 and 38 of multiple apertures delineating the at least one device attachment region, the third set 37 and 38 of multiple apertures being between the first 36 and second 39 apertures, the first aperture 36 and third sets 37 and 38 of multiple apertures delineating a first compliant member 30 therebetween within the at least one device attachment region, the second aperture 39 and third sets 37 and 38 of multiple apertures delineating a second compliant member 31 therebetween within the at least one device attachment region, the first and second compliant members being more compliant than the second

region of the substrate, at least a first of the pads being located on the first compliant member and at least a second of the pads being located on the second compliant member, the surface-mount device being mounted over the third set of multiple apertures,

except, Wannemacher doesn't explicitly teach the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

APA discloses in the "Background of the invention" section (page 2, [0005]), at the time the invention was made, it was known to use the at least one device attachment region and a second region of the substrate being formed of a first material [organic substrates] and the surface-mount device comprising a package formed of a second material [the silicon or ceramic materials of SMT devices] having a lower coefficient of thermal expansion than the first material. But it is not conventional practice because of significant mismatch in coefficients of thermal expansion and as result big stress, developing in such structures. Wannemacher's invention overcame this problem by creating stress controlling mounting structures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

Benefit of doing so is to lower cost of such assembly.

except, Wannemacher doesn't explicitly teach first and second apertures includes first and second sets of multiple apertures.

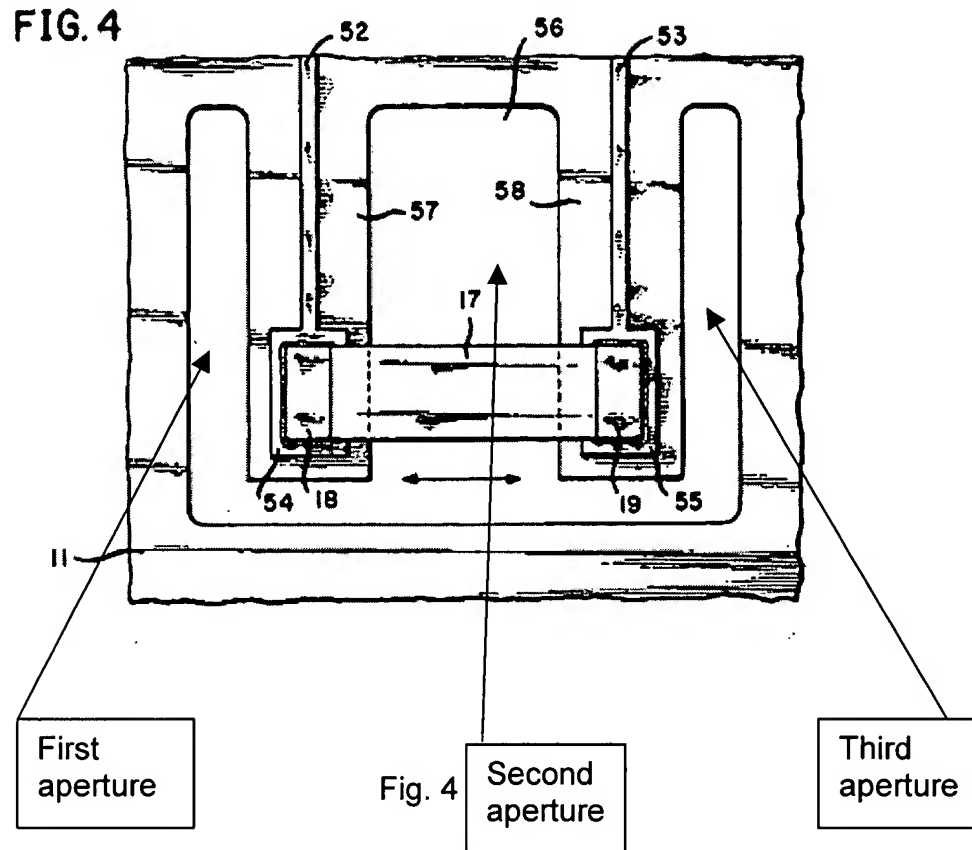
Corisis discloses in first and second apertures includes first and second sets of multiple apertures 96, Fig. 11, and 90, 92, Fig. 10 and column 6, lines 6-11. At time the invention was made, it was well know to use first and second apertures includes first and second sets of multiple apertures to release stresses.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention first and second apertures includes first and second sets of multiple apertures.

Benefit of doing so is to provide better release stresses in such circuit assembly.

5.2.2. Regarding claim 16: And further, Wannemacher discloses in Fig. 3 the circuit assembly according to claim 15, wherein each of the multiple apertures is discrete and circular-shaped in the plane of the substrate.

5.2.3. Regarding claim 17: Wannemacher, as modified, discloses the circuit assembly having all of the claimed features as discussed above with respect claim 15, wherein a central region is defined by and between third set of multiple apertures 37 and 38 Fig. 3.



5.3. Claims 4, 10, and 35 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of APA and in view of Corisis in further view of D. Edwards et al. (Patent # 6064576) hereinafter Edwards.

5.3.1. Regarding claim 4: Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 1,

except, Wannemacher doesn't explicitly teach the first and second apertures is C-shaped in the plane of the substrate.

Edwards discloses in Fig. 5 aperture 36 is C-shaped in the plane of the substrate. At time the invention was made, it was well known to use the apertures with C-shaped in the plane of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the the first and second apertures is C-shaped in the plane of the substrate.

Benefit of doing so is to decrease number of a center of concentration of stresses.

5.3.2. Regarding claims 10, 35: Wannemacher discloses a circuit assembly according to claim 1 (31),

However, Wannemacher doesn't explicitly teach the third aperture has a substantially circular shape in the plane of the substrate.

Edwards discloses in Fig. 4 aperture 36 has a substantially circular shape in the plane of the substrate. At time the invention was made, it was well known to use the aperture with a substantially circular shape in the plane of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the third aperture has a substantially circular shape in the plane of the substrate.

Benefit of doing so is to decrease stress in central region.

5.4. Claims 12, 13, 37 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of APA in further view of D. Busch et al. (Patent # DE 4424984) hereinafter Busch.

5.4.1. Regarding claims 12, 37: Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 11 (36).

However, Wannemacher doesn't explicitly teach at least one of the conductive runners extends along a surface of the substrate between the first and second apertures.

Busch discloses in Fig. 2. the circuit assembly 1 wherein at least one of the conductive runners 11 extends along a surface of the substrate between the first 7 and second 7 apertures. At time the invention was made, it was well know to use the conductive runners extending along a surface of the substrate between the first and second apertures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention at least one of the conductive runners extends along a surface of the substrate between the first and second apertures.

Benefit of doing so is to save space for added traces of the substrate.

5.4.2. Regarding claim 13: Further, Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 11,

except, Wannemacher doesn't explicitly teach at least one of the conductive runners is on an surface defined by at least one of the peripheral borders.

Busch discloses in Fig. 2. one of the conductive runners 11 is on an surface defined by at least one of the peripheral borders. At time the invention was made, it was well know to use at least one of the conductive runners is on an surface defined by at least one of the peripheral borders.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention at least one of the conductive runners is on an surface defined by at least one of the peripheral borders.

Benefit of doing so is to reach more density of traces of the substrate.

5.5. Claims 14, 39 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of APA in further view of A. ElHatem et al. (Patent # 5699231 hereinafter "ElHatem").

5.5.1. Regarding claims 14, 39: Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 1 (31).

However, Wannemacher doesn't explicitly teach, the first and second aperture's are filled with an electrically-nonconductive material that differs from the first and second materials.

ElHatem discloses (column 3, lines 64-66 and column 4, lines 1-7) the first and second aperture's are filled with an electrically-nonconductive material that differs from the first and second materials. At time the invention was made, it was well known to use material that differs from the first and second materials to fill with an electrically-nonconductive material the first and second aperture's.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the first and second aperture's are filled with an electrically-nonconductive material that differs from the first and second materials to provide more stability to such structure.

5.6. Claims 28, 29, 30 are rejected under 35 U.S.C. 103(a) as being obvious over Wannamaker view of APA and in view of E. Schahier (Patent # DE04325499 hereinafter "Schahier") and in view of Edwards et al. (Patent 6064576 hereinafter "Edwards")

5.6.1. Regarding claim 28: Wannemacher discloses in Fig. 1. a circuit assembly comprising a substrate 11 and a surface-mount device 17 mounted thereto, multiple electrically-conductive pads 14 and 15 present on at least one device attachment region 21 and 22 of the substrate, and solder joints bonding the surface-mount device to the pads (column 3, lines 41-44).

However, Wannemacher doesn't explicitly teach the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

APA discloses in the "Background of the invention" section (page 2, [0005]), at the time the invention was made, it was known to use the at least one device attachment region and a second region of the substrate being formed of a first material

[organic substrates] and the surface-mount device comprising a package formed of a second material [the silicon or ceramic materials of SMT devices] having a lower coefficient of thermal expansion than the first material. But it is not conventional practice because of significant mismatch in coefficients of thermal expansion and as result big stress, developing in such structures. Wannemacher's invention overcame this problem by creating stress controlling mounting structures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

Benefit of doing so is to lower cost of such assembly.

However, Wannemacher also fail to explicitly teach the an S-shaped aperture, first and second portions of the S-shaped aperture delineating a first cantilevered member within the at the least one device attachment region of the substrate and extending in a first direction, the second portion and an adjacent third portion of the S-shaped aperture delineating a second cantilevered member within the at the least one device attachment region of the substrate and extending in a second direction opposite the first direction, at least a first of the pads being located on the first cantilevered member and at least a second of the pads being located on the second cantilevered member, the surface-mount device being mounted over the second portion of the S-shaped aperture.

Schahier discloses in Fig. 3. aperture comprises tongue-like aperture 34. Although shape of this aperture doesn't exactly the same as application's S-shaped aperture, but it is very close in shape to this aperture 34 and has all features claimed in claim 28, first 33 and second 35 portions of the aperture delineating a first cantilevered member 24 (left) within the at the least one device attachment region of the substrate [and extending in a first direction, the second portion and an adjacent third portion of the S-shaped aperture delineating a second cantilevered member within the at the least one device attachment region of the substrate and extending in a second direction opposite

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the first direction, at least a first 30 of the pads being located on the first cantilevered member and at least a second 30 of the pads being located on the second cantilevered member, the surface-mount device being mounted over the second portion of the S-shaped aperture. And further Edwards offered lot of different shape of apertures, Fig. 4, 5 and 6. And such, S-shaped aperture is one of many known shape for apertures. And furthermore, it has been held In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) that change in shape and change in size of the configuration of the claimed device was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. At time the invention was made, it was well know to use aperture comprises an S-shaped aperture.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the an S-shaped aperture, first and second portions of the S-shaped aperture delineating a first cantilevered member within the at the least one device attachment region of the substrate and extending in a first direction, the second portion and an adjacent third portion of the S-shaped aperture delineating a second cantilevered member within the at the least one device attachment region of the substrate and extending in a second direction opposite the first direction, at least a first of the pads being located on the first cantilevered member and at least a second of the pads being located on the second cantilevered member, the surface-mount device being mounted over the second portion of the S-shaped aperture to release stress in attachment region of the substrate.

5.6.2. Regarding claim 29: And further, Wannemacher, as modified, discloses the circuit assembly according to claim 28.

However, Wannemacher doesn't explicitly teach each of the first and second cantilevered members has peripheral borders delineated on three sides by the S-shaped aperture, and each of the first and second cantilevered members has a boundary that is not delineated by the S-shaped aperture so as to be contiguous with the second region of the substrate.

Schahier discloses in Fig. 3. each of the first and second compliant members 24 has peripheral borders 33 delineated on three sides by the S-shaped aperture 34, and each of the first and second compliant members 24 has a boundary that is not delineated by the S-shaped aperture so as to be contiguous with the second region of the substrate. At time the invention was made, it was well known to use aperture that is comprised of an S-shape.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention each of the first and second compliant members has peripheral borders delineated on three sides by the S-shaped aperture, and each of the first and second compliant members has a boundary that is not delineated by the S-shaped aperture so as to be contiguous with the second region of the substrate.

Benefit of doing so is to further release stress in attachment region of the substrate.

5.6.3. Regarding claim 30: And further, Wannemacher, as modified, discloses the circuit assembly according to claim 29.

However, Wannemacher doesn't explicitly teach the first and second cantilevered members are separated by the second portion of the S-shaped aperture.

Schahier discloses in Fig. 3. the first 24 (left) and second 24 (right) cantilevered members are separated by the second portion 36 of the S-shaped aperture 34. At time the invention was made, it was well know to use aperture comprises an S-shaped aperture.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the first and second cantilevered members are separated by the second portion of the S-shaped aperture.

Benefit of doing so is to release stress in attachment region of the substrate.

5.7. Claim 38 is rejected under 35U.S.C. 103(a) as being obvious over Wannamaker view of APA and in view of E. Schahier and in view of ElHatem.

5.7.1. Regarding claim 38: And further, Wannemacher, as modified, discloses the circuit assembly having all of the claimed features as discussed above with respect claim 36, wherein each of the first 36 and second slots 39 defines an outward surface facing the device attachment region and an inward surface facing away from the device attachment region and delineating the peripheral border of its respective first 30 or second 31 cantilevered member,

except, Wannemacher doesn't explicitly teach the conductive runners are continuous on the inward area of each of the first and second slots and finally extend to the pads on the first and second cantilevered members.

Schahier discloses in Fig. 3 the conductive runners are continuous on the inward area of each of the first and second slots and finally extend to the pads on the first and second cantilevered members. At time the invention was made, it was well know to use the conductive runners are continuous on the inward area of each of the first and second slots and finally extend to the pads on the first and second cantilevered members.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the conductive runners are continuous on the inward area of each of the first and second slots and finally extend to the pads on the first and second cantilevered members.

Benefit of doing so is to increase density of traces of the substrate.

except Wannemacher to doesn't explicitly teach that the conductive runners are continuous on the outward area of each of the first and second slots.

ElHatem discloses in Fig. 1 the conductive runners 6 are continuous on the outward area of each of the first 14 and second 14 slots. At time the invention was made, it was well know to use the conductive runners are continuous on the outward area of each of the first and second slots.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the conductive runners are continuous on the outward area of each of the first and second slots.

Benefit of doing so is to increase density of traces of the substrate. Although, Wannemacher doesn't explicitly teach that runners are continuous on the surface of the slots but only runners extend along (close to) a surface, as teach claim 37 this structure is still give same benefits (increase density of traces of the substrate) as claim 38. And further, it has been held In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) that change in shape and change in size of the configuration of the claimed device was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention runners are continuous on the surface of the slots to provide of the increasing density of traces of the substrate.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

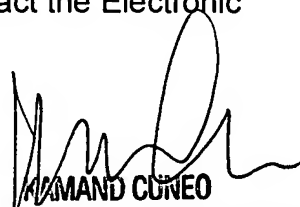
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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

7.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

7.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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